

United States Environmental Protection Agency Washington, DC 20460						Work Assignment Number: ● Original 0-19 Amendment		
Work Assignment								
Contract Number: EP-C-09-027			Contract Period: Base: April 1, 2009 - March 31, 2010 Option Period No.			SF Site Name:		
Title of Work Assignment: Air Toxics from Open Combustion Sources								
Suggested Source: ARCADIS						Specify Section & Paragraph of Contract SOW: 2.0-7.0		
Purpose: ● Work Assignment Initiation Work Assignment Close-Out Work Assignment Amendment Incremental Funding Work Plan Approval						Period of Performance From: April 1, 2009 To: March 31, 2010		
Comments: Continuation of work done under EP-C-04-023, WA40						QA Category (check one) I Enforcement II Standard Setting III Technology Development ● IV Proof of Concept N/A		
Note: To report additional accounting and appropriations data use EPA Form 1900-69A.								
SFO 22 Superfund (Max 2)		Accounting and Appropriations Data					Non-Superfund	
DCN (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount	Sites/Project (Max 8)	Cost Org/Code (Max 7)
1								
2								
3								
4								
5								
Authorized Work Assignment Ceiling								
Contract Period:						Cost/Fee		LOE
Previously Approved						New		0
This Action:								2550
Total								2550
Work Plan / Cost Estimate Approvals								
Contractor WP Dated:						Cost/Fee:		LOE:
Cumulative Approved:						Cost/Fee:		LOE:
Work Assignment Manager Name Brian Gullett (Signature)			Date 3.19.09 (Date)			Branch / Mail Code APT / E305-01 Phone Number (919) 541-1534 Fax Number 919-541-0554		
Branch Chief Name Robert E. Hall, Chief, APTB (Signature)			Date 3/18/09 (Date)			Branch/Mail Code APT / E305-01 Phone Number (919) 541-2477 Fax Number 919-541-0554		
Project Officer Name Diane L. Pierce (Signature)			Date 3/20/09 (Date)			Branch/Mail Code APT / E305-01 Phone Number (919) 541- 2708 Fax Number 919-541- 1536		
Contracting Official Name Renita Tyus (Signature)			Date 3/31/09 (Date)			Branch/Mail Code CP0D Phone Number 513-487-2094 Fax Number 513-487-2109		
Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)							Date	

Work shall not begin until 4/1/09

Statement of Work

AIR TOXICS FROM OPEN COMBUSTION SOURCES

I. BACKGROUND

EPA is undertaking an assessment of the risk to the environment due to emissions of halogenated organic air toxics, particularly dioxins and furans from open and uncontrolled burning sources. Characterization of the various sources for halogenated organic pollutant emissions is inconsistent across sources. Particularly lacking is information regarding uncontrolled combustion sources, due part to the difficulty of obtaining such measurements.

Organic pollutants (including dioxins and furans) have also come under international attention due to the propensity of some of these compounds to bioaccumulate and to cause endocrine disrupting effects. Unfortunately, while combustion sources emit endocrine disrupting chemicals (EDCs) and EDC-suspect compounds, these emissions have been poorly characterized.

II. PURPOSE

It is one purpose of this work assignment to meet the technical needs in support of the concerns mentioned above by undertaking studies of the formation of organic byproducts and metallic toxics during combustion of biomass, accidental fires, and waste burning. Final products that shall result from this work shall include conference and peer-review journal publications. It is further an intent of this work assignment to assist in the fundamental understanding of how toxic air pollutants are formed such that they can be monitored, prevented from forming, or controlled from release.

Background Information and Special Instructions

- The end use clients include APPCD/ORD, OAQPS, OPPT, and OSW as well as the NCEA. These data gathered shall not be used for setting regulations but for guiding our understanding of phenomena that occur in combustion systems and materials processing.
- The Contractor is expected to use government furnished equipment (GFE) for the work. This shall include the bum hut, the outdoor wood fired hydronic heaters (OWHHs), woodstove, aerial sampling equipment, ground-based sampling equipment, the dioxin analytical laboratory equipment, and support equipment.
- The Contractor shall be experienced in formation mechanisms of halogenated and polyaromatic organics, in organic flue gas sampling, PM and criteria pollutant sampling, sampling and analysis for metals, and in analysis of organics.
- Facility operating manuals for the above-mentioned devices shall be followed. Analytical methods and sampling procedures shall follow EPA protocols where practical and applicable.
- If sufficient funds are deemed available by the WAM and CO, the contractor shall send qualified personnel to at least one nationally-known conference for presentation of related results.
- The Contractor is advised that the output of this programmatic effort has typically been scholarly, peer-review journal publications that discuss research that elucidates the formation of products of incomplete combustion. It is the intention of this program to

provide the scientific community and the EPA regulatory community with information regarding these pollutants that shall enable sound, scientific decisions to be made regarding prevention, control, and regulation of these pollutants.

III. STATEMENT OF WORK

The pollutant source(s) chosen for testing in this task shall be determined by ORD and Program Office priorities. The source selections will be conveyed via technical direction to the Contractor:

Agriculture/Waste/Forest Burning; Emissions of Halogenated Organics and other Air Toxics from Open Burning

Facilities and Equipment.

The Contractor is authorized to use Government-furnished facilities. The Contractor shall maintain and operate a sampling apparatus at an Open Burn Test Facility for measurement of emissions from combustion of agricultural waste, domestic waste, and forest material burning.

In addition, the Contractor shall develop, maintain, and operate a mobile ground-based sampling apparatus and an aerial-based apparatus for field use in monitoring dioxin/furan emissions, and copollutants, from open burns.

Method.

The Contractor shall conduct tests, sampling, and sample analyses to examine the emissions of halogenated organics in both gas and fine particulate matter phases. The Contractor shall secure method blanks and ensure the method detection limit and results validity. The Contractor shall also sample for other combustion-derived pollutants, such as PM, black carbon, PM by size, CO, CO₂, and nitrogenous species.

The Contractor shall develop a test matrix and deliver to the Work Assignment Manager (WAM) for approval prior to testing. At least three samples per source shall be gathered and analyzed. Sufficient data on chlorine content, air chlorine content, and criteria pollutants shall be gathered to ensure that estimates of emission factors can be obtained. The carbon balance method shall be applied toward emission factor determination, as appropriate.

The Contractor shall also analyze existing data for determination of emission factors for agricultural, biomass, and waste sources, such as sugarcane, burning residential waste dumps, and forest biomass.

Additional instructions shall be conveyed in writing by the WAM in accordance with the "Technical Direction" clause. Remote, or field, testing may be required, at the technical direction of the WAM.

Reporting.

The Contractor shall ensure that all reporting requirements as specified by the Contract are met. Because the type of tests and methods are pioneering, the work is considered exploratory. The data will not be used for regulations, but may be used as an estimate of a case-specific emission factor for forest fires, uncontrolled waste burning, and agricultural burns.

Quality Assurance.

The Contractor shall adhere to and ensure that all applicable QA/QC and safety and health rules and requirements are met. Since this work covers both development/adaptation of sampling methods to new, unsampled sources and measurement to determine emission factors, the contractor shall develop quality assurance documentation as required for both Method Development projects and Measurement Projects (see Attachment #1 and #2) to this Statement of Work. Work involving environmental data shall

not commence until the quality assurance documentation has received official approval from the EPA Quality Assurance Staff.

Additional.

Additional instructions will be conveyed in writing by the WAM in accordance with the "Technical Direction" clause.

IV. DELIVERABLES AND SCHEDULE

Deliverables

1. **Weekly Meetings and E-Mail Reports:** The WAM and contractor's project manager shall hold biweekly project meetings to discuss Task-specific progress, issues, and action items. The contractor project manager shall send an e-mail report to the WAM within one business day of this meeting, unless otherwise specified by the WAM. The e-mail report shall:

- Specify work goals and priorities for each Task under this work assignment;
- Document action item issues planned in the last weekly meeting for each Task;
- Specify the status of outstanding Task-specific test plans, QA plans, and safety plans;

and

- Itemize issues and concerns that need resolution for each Task.

2. **Monthly Task Progress and Cost Reports:** The contractor's monthly report to EPA shall summarize work activities (accomplished and planned) for each Task in this work assignment, including the status of applicable test, QA, and safety plans. The monthly report shall also detail labor costs and ODC charges.

3. **Health and Safety Protocols:** Health and safety protocols for each Task shall be updated or prepared as required by the EPA ERC and APPCD safety personnel. These protocols shall be approved by the WAM and safety personnel prior to the conduct of any testing.

4. **Quality Assurance Project Plan (QA/QC) and Test Plans:** The contractor shall perform the activities described in these Tasks in accordance with, or with modification to, the QAPPs entitled

- U.S. EPA Evaluation of Dioxin Emissions Pre-testing Phase,
- Burning CCA-Treated Wood in the Open Burn Test Facility (OBTF),
- Development of analysis methods for the study of PCDD/F TEQ indicators, and
- Evaluation of Dioxin-Like Emissions from Residential Wood Combustion.

If the scope of work has changed significantly from that described in the ARCADIS Work Assignment 4-40, the contractor shall revise the QAPP and work involving environmental data shall not commence until it has received official approval from the EPA Quality Assurance Staff. EP-C-04-023

5. **Facility Manual(s):** Relevant manuals shall be reviewed, updated, and approved as specified in QA requirements for facility manuals provided by the EPA QA office.

6. **RCRA Compliance reports for activities conducted in the RCRA and Air permitted facility (as relevant):** These reports shall be provided to the WAM and EPA personnel responsible for the permitted facility, upon request.

V. MILESTONES

The following milestones are identified:

- April 27, 2009. The Contractor shall prepare a Work Plan and update operating documents, including QA plans, H&S protocols, and facility manuals/operating procedures. Updated plans shall be delivered to the WAM.
The work plan is due within 15 days
- May 29, 2009. The Contractor shall complete an analysis of existing data on open burning dioxin/furan emissions from residential dump sources and residential wastes (with varied composition) and submit reports to the WAM as per technical directives issued by the WAM.
- July 31, 2009. The Contractor shall complete an analysis of existing data on open burning dioxin/furan and other air toxic emissions from biomass sources and submit reports to the WAM as per technical directives issued by the WAM.
- March 30, 2010. The Contractor shall conduct field sampling of an open biomass burn or waste burn (at the technical direction of the WAM) with an accompanying open burn test facility test for dioxin/furan/air toxic emissions and other criteria pollutants to determine emission factors.

NRMRL QAPP REQUIREMENTS FOR MEASUREMENT PROJECTS

GENERAL REQUIREMENTS: Include cover page, distribution list, approvals, and page numbers.

0. COVER PAGE

Include the Division/Branch, project title, revision number, EPA technical lead, QA category, organization responsible for QAPP preparation, and date.

1. PROJECT DESCRIPTION AND OBJECTIVES

- 1.1 Describe the process and/or environmental system to be evaluated.
- 1.2 State the purpose of the project and list specific project objective(s).

2. ORGANIZATION AND RESPONSIBILITIES

- 2.1 Identify all project personnel, including QA, and related responsibilities for each participating organization, as well as their relationship to other project participants.
- 2.2 Include a project schedule that includes key milestones.

3. SCIENTIFIC APPROACH

- 3.1 Describe the sampling and/or experimental design that will be used to generate the data needed to evaluate the projective objective(s). A description of the design should include the types and numbers of samples (including QC and reserve samples), the design of the sampling network, sample locations and frequencies, and the rationale for the design.
- 3.2 Identify the process measurements (e.g., flow rate, temperature) and specific target analyte(s) for each sample type.
- 3.3 Describe the general approach and the test conditions for each experimental phase.

4. SAMPLING PROCEDURES

- 4.1 Describe any known site-specific factors that may affect sampling procedures as well as all site preparation (e.g., sampling device installation, sampling port modifications, achievement of steady-state) needed prior to sampling.
- 4.2 Describe or reference each sampling procedure (including a list of equipment needed and the calibration of this equipment as appropriate) to be used. Include procedures for homogenizing, compositing, or splitting of samples, as applicable.
- 4.3 Provide a list of sample containers, sample quantities to be collected, and the sample amount required for each analysis, including QC sample analysis.
- 4.4 Specify sample preservation requirements (e.g., refrigeration, acidification, etc.) and holding times.
- 4.5 Describe the method for uniquely numbering each sample.
- 4.6 Describe procedures for packing and shipping samples, including procedures to avoid cross-contamination, and provisions for maintaining chain-of-custody (e.g., custody seals and records), as applicable.

5. MEASUREMENT PROCEDURES

- 5.1. Describe in detail or reference each process measurement or analytical method to be used. If applicable, identify modifications to EPA-approved or similarly validated methods.
- 5.2. If not provided in Section 5.1 or the referenced method, include specific calibration procedures, including linearity checks and initial and continuing calibration checks.

6. QUALITY METRICS (QA/QC CHECKS)

- 6.1. For each process measurement and analytical method, identify the required QC checks (e.g., blanks, control samples, duplicates, matrix spikes, surrogates), the frequencies for performing these checks, associated acceptance criteria, and corrective actions to be performed if acceptance criteria are not met.
- 6.2. Any additional project-specific QA objectives (e.g., completeness, mass balance) shall be presented, including acceptance criteria.

7. DATA ANALYSIS, INTERPRETATION, AND MANAGEMENT

- 7.1 Identify the data reporting requirements, including data reduction procedures specific to the project and applicable calculations and equations.
- 7.2 Describe data validation procedures used to ensure the reporting of accurate project data.
- 7.3 Describe how the data will be summarized or analyzed (e.g., qualitative analysis, descriptive or inferential statistics) to meet the project objective(s).
 - 7.3.1 If descriptive statistics are proposed, state what tables, plots, and/or statistics (e.g., mean, median, standard error, minimum and maximum values) will be used to summarize the data.
 - 7.3.2 If an inferential method is proposed, indicate whether the method will be a hypothesis test, confidence interval, or confidence limit and describe how the method will be performed.
- 7.4 Describe data storage requirements for both hard copy and electronic data.

8. REPORTING

- 8.1 List and describe the deliverables expected from each project participant responsible for field and/or analytical activities.
- 8.2 Specify the expected final product(s) that will be prepared for the project (e.g., journal article, final report).

9. REFERENCES

Provide references either in the body of the text as footnotes or in a separate section.

NRMRL QAPP REQUIREMENTS FOR METHOD DEVELOPMENT PROJECTS

GENERAL REQUIREMENTS: Include cover page, distribution list, approvals, and page numbers.

0. COVER PAGE

Include the Division/Branch, project title, revision number, EPA technical lead, QA category, organization responsible for QAPP preparation, and date.

1. PROJECT DESCRIPTION AND OBJECTIVES

- 1.1 Provide a description of the situation that requires the generation of a new or modified method.
- 1.2 State the purpose of the project and list specific project objective(s).

2. ORGANIZATION AND RESPONSIBILITIES

- 2.1 Identify all project personnel, including QA, and related responsibilities for each participating organization, as well as their relationship to other project participants.
- 2.2 Include a project schedule that includes key milestones.

3. SCIENTIFIC APPROACH

- 3.1 Identify the specific analyte(s) of interest and the matrix/matrices under study.
- 3.2 Identify the analytical approach that will be used and how it will be optimized for this study. Also describe any tests of interference and analyte stability.
- 3.2 Identify the method performance metrics (QA/QC checks) that will be used to evaluate the method, including the procedures used. These metrics could include (but are not limited to) positive and negative controls, sensitivity, precision, accuracy, recovery, linearity, specificity, robustness, and range.

4. SAMPLING PROCEDURES

- 4.1 Provide the requirements for samples that will be used to test the method (including matrix and presence/concentration of analytes).
- 4.2 If synthetic (i.e., laboratory-prepared) samples are used, describe the preparation of these samples.
- 4.3 If non-synthetic (i.e., real-world sample) samples are used, address the following:
 - describe the sampling design that will be used and the steps taken to assure that representative samples are collected
 - discuss or reference each sampling procedure
 - provide a list of sample containers, sample quantities to be collected, and the sample amount required for each analysis, including QC sample analysis
 - describe procedures for packing and shipping samples, and provisions for maintaining chain-of-custody, as applicable
- 4.4 Specify sample preservation requirements (e.g., refrigeration, acidification, etc.) and holding times.
- 4.5 Describe the method for uniquely numbering each sample.

5. MEASUREMENT PROCEDURES

- 5.1 Describe in detail or reference each preparation or analytical procedure to be used, if known. Include steps for preparation, calibration, measurement, quality control, and reporting.

- 5.2 If not provided in Section 5.1 or the referenced method, include specific calibration procedures, including linearity checks and initial and continuing calibration checks.

6. METHOD PERFORMANCE METRICS

For each method performance metric (QA/QC check) identified in Section 3.2, specify the frequencies for performing these checks, associated acceptance criteria, and corrective actions to be performed if acceptance criteria are not met.

7. DATA ANALYSIS, INTERPRETATION, AND MANAGEMENT

- 7.1 Identify the data reporting requirements, including data reduction procedures specific to the project and applicable calculations and equations.
- 7.2 Describe data validation procedures used to ensure the reporting of accurate project data.
- 7.3 Describe how the data will be summarized or analyzed (e.g., qualitative analysis, descriptive or inferential statistics) to meet the project objective(s).
- 7.3.1 If descriptive statistics are proposed, state what tables, plots, and/or statistics (e.g., mean, median, standard error, minimum and maximum values) will be used to summarize the data.
- 7.3.2 If an inferential method is proposed, indicate whether the method will be a hypothesis test, confidence interval, or confidence limit and describe how the method will be performed.
- 7.4 Describe data storage requirements for both hard copy and electronic data.

8. REPORTING

- 8.1 List and describe the deliverables expected from each project participant.
- 8.2 Specify the expected final product(s) that will be prepared for the project (e.g., journal article, final report, etc.). If a method/SOP will be developed, specify the required format.

9. REFERENCES

Provide references either in the body of the text as footnotes or in a separate section.